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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/817,384	04/02/2004	David L. Jeanmaire	84316AMGB	1149

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EXAMINER
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DO, AN H

ART UNIT	PAPER NUMBER
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2853

DATE MAILED: 04/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

5/2

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/817,384		JEANMAIRE, DAVID L.	
	<b>Examiner</b>		<b>Art Unit</b>	
	An H. Do		2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 April 2004.
- 2a) ☐ This action is **FINAL**.
- 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-12 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:  
    - 1. ☐ Certified copies of the priority documents have been received.
    - 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    - 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/2/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement (IDS) submitted on 02 April 2004 was filed and is being considered by the examiner.

### ***Specification***

2. The abstract of the disclosure is objected to because the word "comprising" in line 4 should be changed to --including-- or --having--. Correction is required. See MPEP § 608.01(b).
3. The disclosure is objected to because of the following informalities: Applicant needs to update all the application continuing data under cross references.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5, 7-9 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Kakutani (US 6,089,691).

Kakutani discloses the following claimed limitations:

Regarding claim 1, a method for printing a plurality of pixels (Figure 11) corresponding to a digital image comprising pixels of image data, the method comprising the steps of: (a) producing a stream of droplets (Figure 10) including

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printing droplets having a first volume (deep dots) each selectively formed over a first time period and non-printing droplets having a second volume (light dots) each selectively formed over a second time period, the second volume being a multiple of the first volume, the multiple being a volume discrimination ratio between printing droplets and non-printing droplets; (b) forming a print command using a half toning algorithm for printing a pixel in a two-dimensional array, the pixel having a print value (Step S100); (c) determining if the print command is invalid by examining previously formed adjacent print commands (Step S120); (d) replacing an invalid print command with a valid print command resulting in a modified error value to be diffused (Step S130); and (e) diffusing the modified error value in accordance with the half toning algorithm (Step S160).

Regarding claim 2, wherein: the diffusing step is performed one-dimensionally (Step S160).

Regarding claim 3, wherein: the diffusing step is performed two-dimensionally (Step S160).

Regarding claim 4, wherein: the half toning algorithm is an error diffusion algorithm (Step S160).

Regarding claim 5, wherein: an invalid print command for a selected nozzle is one in which the binary print sequence is 1, 0, 1 (Figure 19).

Regarding claim 7, wherein: substantially a same number of droplets are printed in a contiguous area of pixels of the digital image as would have been printed if an

original sequence of pixels of image data that includes invalid print commands could have been executed (Figure 13).

Regarding claim 8, wherein: the error diffusion algorithm uses input data that is scaled from 0 to 255 and produces binary output data (column 16, lines 48-50).

Regarding claim 9, further comprising the step of: repeating steps (a) through (e) for each of the plurality of pixels corresponding to the digital image (Figure 11, "TO NEXT PIXEL" after step S160).

Regarding claim 11, wherein: the step of producing the stream of droplets includes selectively actuating a heater at a plurality of frequencies (Figures 26A-26E, column 29, lines 27-40).

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kakutani (US 6,089,691) in view of Chwalek et al (US 6,505,921).

Kakutani discloses the claimed invention except for reciting the following claimed features:

Regarding claim 10, further comprising the steps of: (a) flowing a gas at an angle with respect to the stream of droplets; (b) separating the droplets of the first volume

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from the droplets of the second volume; (c) collecting the droplets of the second volume; and (d) allowing the droplets of the first volume to contact a print media.

Regarding claim 12, further comprising the step of: recycling the droplets of the second volume for subsequent re-use.

Chwalek et al teach the following features:

Regarding claim 10, further comprising the steps of: (a) flowing a gas at an angle with respect to the stream of droplets (Figures 2A and 2C, column 6, line 29 to column 7, line 8); (b) separating the droplets of the first volume from the droplets of the second volume (Figures 2A and 2C, column 6, line 29 to column 7, line 8); (c) collecting the droplets of the second volume (Figures 2A and 2C, column 6, line 29 to column 7, line 8); and (d) allowing the droplets of the first volume to contact a print media (Figures 2A and 2C, column 6, line 43 to column 7, line 8).

Regarding claim 12, further comprising the step of: recycling (unit 19) the droplets of the second volume for subsequent re-use (Figures 2A, 2C and 4, column 6, line 29 to column 7, line 8, column 10, lines 38-67).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the gas flowed with the droplets and recycling the droplets, as taught by Chwalek et al into Kakutani for the purpose of physically increasing the separation between ink drops traveling along different paths (column 4, lines 9-12).

***Allowable Subject Matter***

8. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The primary reason for the allowance of claim 6 is the inclusion of the method step of replacing the invalid print command with a valid print command resulting in a modified error value to be diffused, wherein an invalid print command for a selected nozzle is one in which the binary print sequence is a 1 followed by a number n of 0s followed by another 1 wherein n is less than the volume discrimination ratio. It is this step found in the claims, as it is claimed in the combination of, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Jeanmaire et al (US 6,450,628) disclose a continuous ink jet printing apparatus with nozzles having different diameters. Takahashi et al (US 6,257,686) disclose an ink droplet ejecting that provides a plurality of waveforms in accordance with whether there is ink ejection just before and just after one dot.

**Contact Information**

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to An H. Do whose telephone number is 571-272-2143.

The examiner can normally be reached on Monday-Friday (Flexible).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on 571-272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AD  
March 30, 2006



An H. Do  
Examiner  
Art Unit 2853